CHAPTER 4: DESCRIPTION OF THE EXISTING ENVIRONMENT

4.1 INTRODUCTION

This chapter of the *Site-wide Environmental Impact Statement for Continued Operation of Lawrence Livermore National Laboratory and Supplemental Stockpile Stewardship and Management Programmatic Environmental Impact Statement* (LLNL SW/SPEIS) describes the environmental setting and existing conditions associated with the current operations of LLNL. The information presented in this chapter forms a baseline for evaluating the environmental impacts associated with implementing the No Action Alternative, Proposed Action, and Reduced Operation Alternative.

4.2 LAND USES AND APPLICABLE PLANS

This section summarizes existing onsite and surrounding land uses at the Livermore Site, offsite leased properties, and Site 300, as well as adopted land use plans applicable to surrounding areas. It also describes local land use plans and city and county programs. City or county organizations have no planning jurisdiction at the site because LLNL is a Federal facility owned by the U.S. Department of Energy (DOE). Nevertheless, LLNL does consider local planning policies, to the extent practicable, in its land use decisions as a good neighbor policy.

4.2.1 Existing Land Uses

4.2.1.1 *Livermore Site*

Onsite Land Uses

Onsite land uses at the 821-acre Livermore Site include offices, laboratory buildings, support facilities such as cafeterias, storage areas, maintenance yards, and a fire station; roadways, parking areas, buffer zones, and landscaping. The site also includes internal utility and communication networks. See Chapter 2 and Appendix A of this LLNL SW/SPEIS for detailed descriptions of onsite land uses, facilities, and major programs. A 500-foot-wide security buffer zone lies along the northern and western borders of the Livermore Site.

Surrounding Land Uses

All designations used in this section are from the relevant municipal or county general plan and zoning maps. Figure 4.2.1.1–1 illustrates land uses near the Livermore Site.

The Livermore Site is bordered on the east by Greenville Road. The property east of Greenville Road is agricultural with a few scattered rural residences and is used primarily for grazing. A Western Area Power Administration (WAPA) electrical substation is on the southeast corner of Greenville Road and Patterson Pass Road. The South Bay Aqueduct, a branch of the California Aqueduct, traverses the land east of the Livermore Site in a north-south direction. The Patterson Reservoir and filtration plant for the South Bay Aqueduct are northeast of the Livermore Site along Patterson Pass Road.

Patterson Pass Road runs along the northern boundary of the Livermore Site. A light industrial park lies across Patterson Pass Road to the north. Several new industrial park complexes have been completed in recent years. A Union Pacific Railroad line runs in an east-west direction along the northern boundary of the industrial park. Land uses farther north include vacant land, industrial, and Interstate 580 (I-580). Land northeast of the site is agricultural and used primarily for grazing. Wind turbines are installed on the hills of the Altamont Pass, northeast of the site.

Vasco Road borders the Livermore Site to the west. A low-density, single-family residential subdivision begins at the southwest corner of Patterson Pass Road and Vasco Road and extends south and west. A new housing development of attached single-family residences is currently being completed directly west of the site (north of East Avenue). Medium-density residential areas, mainly apartment complexes, exist on the west side of this new development approximately 2,000 feet west of Vasco Road.

East Avenue borders the Livermore Site to the south. Sandia National Laboratories, California (SNL/CA), which has land uses very similar to those at LLNL, is south of East Avenue. The primary land uses to the east and west of SNL/CA are rural residential and agricultural (mainly grazing). The Stivers Academy, a Kindergarten through 8th grade school, is located west of SNL/CA on the east side of Vasco Road, between East Avenue and Tesla Road. Public access to the section of East Avenue common to the Livermore Site is administratively controlled. There is a small light-industrial park on the southwest corner of East Avenue and Vasco Road. Single-family housing is being built south of this industrial park.

LLNL also conducts limited activities at various leased properties near the Livermore Site. These include a combination office, childcare, and classroom facility at the Almond Avenue Site in the city of Livermore; a storage warehouse with a service shop for the assembly of laser components at Graham Court in the city of Livermore; a storage warehouse facility on Patterson Pass Road in the city of Livermore; and the Arroyo Mocho pump station located 7 miles south of the Livermore Site. These nearby offsite-leased properties are shown in Chapter 2, Figure 2.1–2.

4.2.1.2 *Site 300*

Onsite Land Uses

Site 300 comprises approximately 7,000 acres of largely undeveloped land. Site 300 is primarily a nonnuclear explosives and other nonnuclear weapons component test facility. The site has four remote explosive testing facilities supported by a chemistry processing area, a weapons test area, maintenance facilities, and a General Services Area (GSA) at the site entrance. One hundred sixty acres at Site 300 have been set aside as the "*Amsinckia grandiflora* Reserve" to protect this species' natural habitat.

Surrounding Land Uses

Figure 4.2.1.2–1 shows the existing land uses surrounding Site 300, the majority of which are agricultural, primarily for grazing cattle and sheep. Two other smaller, privately operated research and testing facilities are located near Site 300. The property east of and adjacent to Site 300 is now owned by Fireworks America and is currently being used to store pyrotechnics. A portion of the property is leased to Reynolds Initiator Systems, Inc., and is used to manufacture initiators, which are agents that cause a chemical reaction to commence.

A facility operated by SRI International, that conducts explosives tests, is approximately 0.6 miles south of Site 300.

Corral Hollow Road borders Site 300 on the south. The Carnegie State Vehicular Recreation Area is south of the western portion of Site 300, across Corral Hollow Road. It covers approximately 5,000 acres and is operated by the California Department of Parks and Recreation, Off-Highway Motor Vehicle Recreation Division, for the exclusive use of off-highway vehicles. The nearest urban area is the city of Tracy, approximately 2 miles northeast of Site 300. Rural residences are located along Corral Hollow Road, west of Site 300 and the Carnegie State Vehicular Recreation Area. Power-generating wind turbines occupy the land northwest of the site.

4.2.2 Land Use Plans and Programs

For land use planning purposes, a city or county general plan usually contains land use designations. A land use designation is assigned to an area of land to indicate its planned and intended use to guide future development. Land use designations serve as a general guide for development and as a guide for determining whether new uses will be compatible with existing land uses or land use designations. Zoning designations are assigned to an area of land for the purpose of regulating its permitted use, massing, and density.

4.2.2.1 *Livermore Site*

The city of Livermore and Alameda County do not have planning jurisdiction over the Livermore Site because it is a Federal facility owned by DOE. However, for purposes of providing a complete description to the public and decision makers of the existing and potentially affected environment, local land use planning in the vicinity of the Livermore Site is presented in this section.

The Livermore Site is in Alameda County. The western 1,100 feet of the Livermore Site are within the city of Livermore. Although the remainder of the Livermore Site is outside the Livermore city limits, the site remains within the city of Livermore's sphere of influence. The Livermore Site and surrounding areas have land use designations under both the Alameda County and city of Livermore general plans.

Alameda County Planning Programs

Alameda County General Plan: East County Area Plan

The East County Area Plan replaces the Livermore-Amador Valley Planning Unit General Plan. The East County Area Plan was adopted by the Alameda County Board of Supervisors on May 5, 1994, and was amended most recently in May 2000 (Alameda County 1994).

Figure 4.2.2.1–1 shows the Alameda County and city of Livermore land use designations for the Livermore Site and surrounding areas. Figure 4.2.2.1–1 also shows the urban growth boundary used by the county and the city. This boundary shows the Livermore Site outside the urban growth area. Areas north and west of the Livermore Site are designated as lands within the Livermore city limits and are within the urban growth boundary. The area to the south, including SNL/CA, is also within the urban growth boundary. Policy 144 of the East County Plan states "The County shall ensure that all new uses approved near the Lawrence Livermore National Laboratories in East Livermore are compatible with Laboratory operations."

The county describes the land use designations in and near the Livermore Site as follows:

Industrial Areas—This category provides for manufacturing and processing uses as well as administrative and laboratory uses.

- **Large Parcel Agricultural**—This category allows for both intensive and extensive agricultural activities and for other open-space uses, such as range and watershed management, consistent with site conditions and plan objectives and policies. The category includes privately held lands, as well as publicly owned lands not otherwise designated in the General Plan for major park or major public uses.

- **Residential Areas**—Density and housing unit assumptions for the Livermore planning area are based on analysis of existing development, current zoning, and city and county plan development proposals. The East County Area Plan indicates four urban residential density ranges: low, medium, medium-high, and high. The East County Area Plan also provides for a Rural Density Residential designation.

The portion of the Livermore Site within Alameda County is designated industrial. SNL/CA, south of East Avenue, is also designated industrial. The areas adjacent to SNL/CA on the east, west, and south are designated limited agriculture. The areas directly east of the Livermore Site, across Greenville Road, are designated large parcel agricultural.

The East County Area Plan identifies open space areas in the Open Space Diagram. Features from the Open Space Diagram are included in Figure 4.2.2.1–2. The land adjacent to the Livermore Site on the east is designated in the Open Space Diagram as large parcel agricultural. There are no other open space areas adjacent to the Livermore Site, but there are other designated open space areas in east Alameda County in the general vicinity of the Livermore Site. Two areas are designated as parklands: one is approximately 4 miles south and the other is approximately 3 miles north of the Livermore Site. An area designated as a Wind Resource Area is approximately 3 miles northeast and east of the Livermore Site. The South Bay Aqueduct, which is designated as Water Management, runs northeast to southwest approximately 100 yards west of the Livermore Site.

South Livermore Valley Area Plan

The East County Area Plan incorporates the South Livermore Valley Area Plan in its entirety (Alameda County 1994). Policies 339 through 341 for the South Livermore Valley Area Plan state the following:

- The county shall encourage the expansion of cultivated agriculture, particularly viticulture.

- The county shall prohibit additional development in the unincorporated portions of the South Livermore Valley unless it will directly further the purpose of expanding and enhancing cultivated agriculture.

- The county shall encourage the establishment and permanent protection of existing and new cultivated agricultural lands.

Potentially relevant policies from the open space section include:

Policy 73. The county shall require buffers between those areas designated for agricultural use and new nonagricultural uses within agricultural areas or abutting parcels. The size, configuration, and design of buffers shall be determined based on the characteristics of the project site and the intensity of the adjacent agricultural uses and if applicable, the anticipated timing of future urbanization of adjacent agricultural land where such agricultural land is included in a phased growth plan. The buffer shall be located on the parcel for which a permit is sought and shall provide for the protection of the maximum amount of arable, pasture, and grazing land feasible.

Alameda County Zoning

The Livermore Site lies within Alameda County and most of it is zoned "MP" for industrial-park use. The Alameda County Zoning Code specifies "laboratory, including research, commercial, testing, developmental, experimental or other types" as a permitted use within the MP Zone. The remaining portions of the Livermore Site lie within the city of Livermore and are not subject to county zoning.

City of Livermore Planning Programs

Livermore Community General Plan, 1976–2000

The Livermore Community General Plan, 1976–2000, was adopted by the Livermore City Council on March 8, 1976, and updated in August 1998 (City of Livermore 1975). The planning area for the city of Livermore encompasses approximately 88,960 acres and is bordered on the north by the Alameda County line, on the east by the ridgeline of the Altamont Hills, on the south by a line 8 miles south of the Livermore City Hall, and on the west by the Murray-Pleasanton Township. The largest single use within the city of Livermore planning area is open space (83 percent), mostly grassland.

Of the urban developed area, 50 percent is devoted to residential uses, 22 percent to streets, over 18 percent to public uses, and the remainder to commercial/industrial uses (City of Livermore 1975). Among the relevant land use policies in the Livermore Community General Plan are the following:

- The city shall make industrial development subject to design principles and performance standards that support environmental resources management policies.

- The city shall encourage the retention in open space of as much land as possible for agriculture, viticulture, rangeland, and grassland.

- Open space shall be used to protect and enhance local community character and identity and to guide the physical shape and direction of urban growth to preserve the rural characteristics of the area.

- Open space shall be used as a buffer between incompatible land uses within urban or essentially undeveloped areas.

- The city shall apply regulations that reserve large tracts for exclusive industrial use to encourage development of an industrial community and prevent encroachment by incompatible uses.

The city of Livermore has also adopted specific policies of Alameda County's South Livermore Valley Area Plan under its own South Livermore Valley Policies, including:

- Using economic incentives to facilitate the expansion of cultivated agriculture.

- Creating permanent urban/rural boundaries to protect the long-term viability of agriculture/viticulture.

These policies are directed at development within the Livermore city limits and include specific area designations and policies to encourage preserving agricultural lands and limiting commercial and residential development that may reduce agricultural lands.

Figure 4.2.2.1–1 illustrates the land use designations for the Livermore Site and surrounding areas as determined by the Livermore Community General Plan land use map (City of Livermore 2002a). Most of the Livermore Site is designated low intensity industrial, with the northern 500-foot perimeter area designated high intensity industrial. The Livermore Community General Plan designates the areas north of the Livermore Site as high intensity industrial. Areas west of the Livermore Site are designated as urban low-medium residential to urban high residential. Small areas within the residential areas are designated as open space parks, which include parks, trail ways, recreation corridors, and protected areas. Areas south and east of the Livermore Site and SNL/CA are designated low intensity industrial and the area farther east of Greenville Road is designated as limited agricultural with a 20-acre minimum lot requirement.

North Livermore Area General Plan Amendment

The Livermore City Council adopted the North Livermore Area General Plan Amendment in March 1988 (City of Livermore 1975). The North Livermore area comprises the portion of North Livermore bordered on the west by the western city limits of the Springtown Community, on the north and east by the base of the Livermore foothills, and on the south by I-580. The North Livermore Area General Plan Amendment revised the pattern of residential land uses and densities, and provided for supporting neighborhood commercial facilities, community facilities, and open space uses. The amendment provides for a 35-percent increase in residential land use, a 54-percent increase in commercial use, a 32-percent decrease in public facility use, and a 51-percent decrease in open space and agriculture use over a 20 to 25 year planning horizon (City of Livermore 1975). This amendment allowed for approximately 3,000 more dwelling units and approximately 170 more commercial acres to be built in the Springtown Community. Most development permitted by this amendment has been completed.

City of Livermore Zoning

The northern perimeter area is zoned I-3 for heavy industrial use, and the western perimeter area is zoned I-2 for light industrial use (City of Livermore 2002a). The city of Livermore zoning ordinance provides for manufacturing facilities, warehousing, and distribution facilities; research

and development facilities; professional and administrative offices, restaurants, wholesale certified recycler and recycle processor facilities; and off-street parking as principal permitted uses within the I-2 zones. In addition to those uses in the I-2 zone, the I-3 zone permits contractor storage yards, truck terminals, or other open storage uses and recycle processor uses (City of Livermore 1975).

The surrounding areas north of the Livermore Site are designated I-3. Areas west of the Livermore Site are designated as PD for planned development, PDR for planned-development residential, RS-3 for residential use with a maximum density of three dwelling units per acre, RG-10 for suburban-multiple-residential use (approximately 10 dwelling units per acre), RS-5 for residential use with a maximum density of five dwelling units per acre, and RL-6 for low-density residential with a minimum lot size of 6,000 square feet.

Livermore Municipal Airport Master Plan

The Livermore Municipal Airport is located just south of I-580/Airway Boulevard. The Livermore Municipal Airport Master Plan, prepared for the city of Livermore in 1975, provides guidelines for the future development of airport facilities (City of Livermore 1975). The master plan includes a land use map for the airport vicinity, illustrating projected land uses for 1995. Land uses shown on this map are consistent with existing land uses surrounding the airport, with the exception that the area adjacent to the southern boundary of the airport is designated for future "general or light industry." Section 4.13 provides information on current airport operations.

On March 25, 1991, the Livermore City Council established an airport protection area (Resolution No. 90-11) (LLNL 1992a). The amendment prohibits new residential land use designations or the intensification of existing land use designations within the airport protection area. The protection area was established to ensure continued safety in the airport region and to avoid potential noise incompatibilities between the airport and encroaching residential uses.

The city of Livermore has completed a draft revision of the Livermore Municipal Airport Master Plan and is reviewing the completed Initial Study and Environmental Assessment (IS/EA) and is reviewing the IS/EA. Upon approval of the IS/EA, the city will consider adoption of the Airport Master Plan (City of Livermore 2002b).

4.2.2.2 *Site 300*

Most of Site 300 is in San Joaquin County, with a small portion in Alameda County. The city of Tracy is located approximately 2 miles northeast of the site. Planning programs of these three government entities are addressed below to provide a basis for evaluating Site 300's compatibility with future surrounding land uses. San Joaquin and Alameda counties and the city of Tracy do not have planning jurisdiction over Site 300 because it is a Federal facility, owned by DOE.

San Joaquin County Planning Programs

San Joaquin County General Plan

The San Joaquin County Board of Supervisors adopted the San Joaquin County General Plan on June 29, 1992 (San Joaquin County 1992). The land use/circulation element of the General Plan contains goals, objectives, and principles for land use development and circulation and transportation within San Joaquin County.

Figure 4.2.1.2–1 shows the land use designations for Site 300 and the surrounding areas. The San Joaquin County General Plan land use designations are described in Table 4.2.2.2–1.

The portion of Site 300 in San Joaquin County is designated public and quasi-public. Areas north and east of Site 300 are designated general agricultural. Areas south of Site 300 along Corral Hollow Road are designated as recreation and conservation areas. Areas to the north and west are designated as general agriculture.

The following are resources/agricultural policies of the San Joaquin County General Plan that could be relevant to a public facility in or near an agricultural area:

- Agricultural areas shall be used principally for crop production, ranching, and grazing. All agricultural support activities and nonfarm uses shall be compatible with agricultural operations.

- Agriculture shall be protected from nuisance complaints from nonagricultural land uses by appropriate regulatory and land use planning mechanisms.

- Nonagricultural land uses at the edge of agricultural areas shall incorporate adequate buffers (e.g., fences and setbacks) to prevent conflicts with adjoining agricultural operations.

Open space areas include the San Joaquin portion of the Carnegie State Vehicular Recreation Area. As illustrated in Figure 4.2.2.1–2, a corridor along Corral Hollow Road is designated as a conservation area and the areas surrounding Site 300 to the north, south, and east are designated as extensive agricultural areas.

TABLE 4.2.2.2–1.—*San Joaquin County Land Use Designations*

General Agriculture	Areas generally committed to agriculture with viable commercial agricultural enterprises that require large land areas to efficiently produce their crops.
Limited Agriculture	Areas with small-scale agricultural operations on 5 to 10 acres.
Agriculture-Urban Reserve	Areas currently undeveloped and perhaps in agricultural production but expected to be converted to urban uses at some point, most likely beyond the planning period of this plan.
Rural Residential	Large lot (1 to 5 acres) residential development where full urban services are not available or expected.
Very Low Density Residential	Large lot (0.5 to 1 acre) residential development within urban communities, with community sewerage, water, and drainage.
Low Density Residential	Single-family dwelling units at two to six dwelling units per gross acre.
Medium Density Residential	Mobile home parks, and attached units such as duplexes, triplexes, and fourplexes at 6 to 10 dwelling units per gross acre.
Medium-High Density Residential	Attached units such as townhouses and garden apartments at 10 to 15 dwelling units per gross acre.
High Density Residential	Apartment buildings and other multifamily dwelling units at 15 to 40 dwelling units per gross acre.
Neighborhood Commercial	Small, localized retail and/or service businesses that offer goods and merchandise to the immediate neighborhood.
Community Commercial	Areas offering a full range of commercial retail and service establishments, allowing comparison shopping and serving urban communities or regional markets.
General Commercial	Areas offering a wide variety of individual, specialized retail and service uses that are typically not oriented to comparison shopping, may require single-purpose trips, and cater to urban communities or regional markets.
Office Commercial	Administrative or professional offices.
Freeway Service	Commercial uses oriented almost exclusively to serving the needs of the freeway traveler.

Source: San Joaquin County 1992.

San Joaquin County Zoning

The portion of Site 300 in San Joaquin County is zoned AG-160 for general agriculture with a 160-acre minimum parcel size. The agricultural zone was established to preserve agricultural lands for the continuation of commercial agricultural enterprises. In addition, hazardous industrial operations using explosives are permitted within the agricultural zone, subject to use permits (San Joaquin County 1992).

Alameda County Planning Programs

Alameda County General Plan, East County Area Plan

The East County Area Plan designates the area surrounding Site 300 in Alameda County as "major public" (Alameda County 1994). The East County Area Plan Policy 138 states "the County shall allow development and expansion of major public facilities (e.g., hospitals, research facilities, landfill sites, jails, etc.) in appropriate locations inside and outside the Urban Growth Boundary consistent with the policies and Land Use Diagram of the East County Area Plan."

Alameda County Zoning

The portion of Site 300 in Alameda County is zoned A for agricultural use. The Alameda County ordinance code specifies "remote testing facilities" as a conditional use within the A district, subject to approval by the zoning administrator for Alameda County (Title 17, Chapter 6, Section 40, Conditional Uses).

City of Tracy Planning Programs

City of Tracy General Plan

Site 300 is approximately 2 miles southwest of the city of Tracy. The Site 300 area is designated on the city of Tracy Community Areas Map as Federal Reserve/Open Space (City of Tracy 1993). Site 300 borders the city of Tracy's sphere of influence, which is designated as the Tracy Hills area. The Tracy Hills planning area includes both Tracy sphere of influence lands in San Joaquin County and an area southwest of I-580 recently annexed by the city of Tracy. The area adjacent to Site 300 in Tracy's sphere of influence has been designated open space habitat. The Tracy Hills area within the city limits of Tracy has been zoned as low and medium density residential. A residential development project has been proposed for the Tracy Hills area and is expected to break ground in 2006.

Tracy Municipal Airport Master Plan

The Tracy Municipal Airport is located within the southwestern portion of the city of Tracy. The airport is surrounded by aggregate mineral extraction operations to the north, south, and east. The Delta-Mendota Canal borders the airport on the west and southwest. Section 4.13 provides information on current airport and LLNL-related operations. The San Joaquin County General Plan identifies the Tracy Metropolitan Airport area of influence as extending from the airport to the edge of the current city limits just south of I-280 (San Joaquin County 1992).

The Tracy Municipal Airport Master Plan was prepared in 1998 for the city of Tracy (City of Tracy 1998). The master plan provides data from 1998 on airport facilities, operations, and capacity, and forecasts future airport demands.

4.3 SOCIOECONOMIC CHARACTERISTICS AND ENVIRONMENTAL JUSTICE

This section describes the existing socioeconomic characteristics of LLNL and the surrounding areas, focusing primarily on Alameda, San Joaquin, Contra Costa, and Stanislaus counties. Approximately 93 percent of LLNL employees reside within these four counties. These four counties make up the region of influence (ROI) for this resource (Figure 4.3–1).

4.3.1 Employment

Employment characteristics of the communities in the region surrounding the Livermore Site and Site 300 are presented in this section by the four counties and major cities within the ROI. Specific employment information about LLNL is integrated into this discussion and summarized at the beginning of Section 4.3.2.

Alameda County

The California Employment Development Department (EDD) reported a total employed labor force of 721,000 persons in Alameda County (Table 4.3.1–1) for the year 2001. This represented a 13.3-percent increase of employed persons over the 1991 annual average of 636,300. The average annual unemployment rate for 2001 was 4.5 percent (33,900 persons), which was lower than the statewide average of 5.3 percent for the same year (EDD 2002a).

During the 1990s, Alameda County's employment mix continued its shift away from heavy industries, which were either in decline or stagnant, and toward office- and service-related industries, particularly high technology. Employment opportunities created by this shift helped to invigorate the county's economy and stimulate population growth. By the end of the 1990s, this shift in population growth had peaked. Employment projections through 2006 estimate wholesale trade, services, and manufacturing as the three employment sectors that will experience the greatest percent job growth (EDD 2002b).

San Joaquin County

The EDD reported a 2001 total employed labor force of 241,600 persons in San Joaquin County (Table 4.3.1–1). This represented an 18.5-percent increase over the 1991 annual average of 203,900. The average 2001 unemployment rate was 8.7 percent (23,100 persons), substantially higher than the state average for that year (5.3 percent) (EDD 2002a). Agricultural areas, such as in San Joaquin County, tend to have greater seasonal variations in employment and higher unemployment rates than non-agriculturally based communities. Robust job growth is expected through 2006, with services, retail trade, and government expected to experience the greatest percent increase (EDD 2002b).

TABLE 4.3.1–1.—*Employment and Income Profile in the Four-County Region of Influence*

	Alameda	San Joaquin	Contra Costa	Stanislaus	ROI
		Employment			
Total Labor Force					
Number of available workers (2001 average)	754,900	264,700	509,800	210,300	1,739,700
Employed	721,000	241,600	493,100	188,800	1,644,500
Unemployed	33,900	23,100	16,700	21,500	95,200
Percent unemployed	4.5%	8.7%	3.3%	10.2%	5.5%
LLNL Labor Force (September 2002)					
Number of workers	4,919	1,636	1,132	533	8,220 [a]
Percent of 2001 workforce	0.7%	0.6%	0.2%	0.3%	0.5%
		Income			
Personal Income for Total Labor Force (2000 Average)					
Total personal income ($1,000)	$55,972,377	$13,208,972	$39,194,448	$10,302,276	$108,375,797
Per capita income ($)	$38,624	$23,242	$41,110	$22,889	$36,479

Sources: BEA 2002, EDD 2002a, LLNL 2003ak.

[a] Represents 93 percent of the 8,850 total labor force directly employed by LLNL living in the ROI.

LLNL = Lawrence Livermore National Laboratory; ROI = region of influence.

Contra Costa County

The EDD reported a 2001 total employed labor force of 493,100 persons in Contra Costa County (Table 4.3.1–1). This represented a 19.9-percent increase over the 1991 annual average of 411,400. The average annual unemployment rate for 2001 was 3.3 percent (16,700 persons), which was significantly lower than the statewide average of 5.3 percent for the same year (EDD 2002a).

Contra Costa County's varied economic base is dominated by the services industry, which accounts for 32 percent of total employment. The job growth forecast to 2006 indicates services jobs will grow at the greatest pace, followed by government and retail trade (EDD 2002b).

Stanislaus County

The EDD reported a total employed labor force of 188,800 persons in Stanislaus County for 2001 (Table 4.3.1–1). This represented a 20.6-percent increase over the 1991 annual average of 156,500. The average annual unemployment rate for 2001 was 10.2 percent (21,500 persons), which was significantly higher than the statewide average of 5.3 percent for the same year (EDD 2002a). Agricultural areas, such as in Stanislaus County, tend to have greater seasonal variations in employment and higher unemployment rates than non-agriculturally based communities.

While agriculture has traditionally been the basis of Stanislaus County's economy, other economic sectors are expanding dramatically. Growth is expected through 2006 in all major industries, with services, manufacturing, and retail trade experiencing the greatest percentage increases (EDD 2002b).

Lawrence Livermore National Laboratory

As of September 2002, approximately 8,850 persons were employed by LLNL (8,610 at the Livermore Site and 240 at Site 300) (LLNL 2003ak). This total does not include contractor personnel involved in various technical and administrative support or facility construction operations, which may include up to 1,750 additional persons.

4.3.2 Population

Of the approximately 8,850 employees working at LLNL at the end of September 2002, 8,220 lived within Alameda, San Joaquin, Contra Costa, and Stanislaus counties (Table 4.3.2–1). The majority of LLNL personnel reside in Alameda County, with the largest concentration (approximately 3,270 employees) residing in the city of Livermore. Recent shifts in population have led workers east, making the city of Tracy the second largest concentration of LLNL employees (approximately 720). Pleasanton is home to approximately 550 LLNL employees, while about 420 reside in Manteca (LLNL 2003ak).

TABLE 4.3.2–1.—*Geographic Distribution of Lawrence Livermore National Laboratory Employee Residences by County and Major Cities, 2002*

County	Livermore Site	Site 300	Total
Alameda	4,871	48	4,919
San Joaquin	1,528	108	1,636
Contra Costa	1,108	24	1,132
Stanislaus	485	48	533
Other counties	622	11	633
Total	**8,614**	**239**	**8,853**
City, County			
Livermore, Alameda	3,239	35	3,274
Tracy, San Joaquin	674	48	722
Pleasanton, Alameda	541	6	547
Manteca, San Joaquin	390	32	422
Castro Valley, Alameda	353	3	356
Modesto, Stanislaus	251	28	279
Brentwood, Contra Costa	231	8	239
San Ramon, Contra Costa	235	1	236
Stockton, San Joaquin	218	14	232
Dublin, Alameda	188	2	190
Oakland, Alameda	188	0	188

Source: LLNL 2003ak.

The populations of each county in the ROI are described below and summarized in Table 4.3.2–2.

TABLE 4.3.2–2.—*Historic and Projected Population Within the Four-County Region of Influence*

	Year				
County	**1990 (actual)** [a]	**2000 (actual)** [a]	**2005** [b]	**2010** [b]	**2015** [b]
Alameda	1,279,182	1,443,741	1,580,200	1,671,200	1,735,800
San Joaquin	480,628	563,598	645,600	727,800	803,400
Contra Costa	803,732	948,816	1,021,400	1,071,400	1,108,100
Stanislaus	370,522	446,997	522,700	587,600	646,800
Total	2,934,064	3,403,152	3,769,900	4,058,000	4,294,100
Average annual % growth	—	1.5	2.1	1.5	1.1

Sources: [a] Census 2002a, [b] California Department of Finance (DOF) 2001.

Alameda County

In 2000, the population of Alameda County was 1,443,741 (Census 2002a), 166,972 of which lived within the communities of Livermore, Pleasanton, and Dublin, near the Livermore Site (Census 2002b). A supplementary survey profile estimates the 2001 Alameda County population at 1,430,686 (Census 2003). During the 10-year period from 1990 through 2000, the population increased 12.9 percent. From 2000 through 2015, Alameda County is expected to grow by approximately 292,000 residents, an increase of 20.2 percent (DOF 2001). Increases to population growth during this period may be constrained by a lack of land suitable or available for development.

San Joaquin County

In 2000, the population of San Joaquin County was 563,598 (Census 2002a). A supplementary survey profile estimates the 2001 San Joaquin County population at 576,553 (Census 2003). During the 10-year period from 1990 through 2000, the population increased 17.3 percent. From 2000 through 2015, San Joaquin County is expected to grow by approximately 240,000 residents, an increase of 42.5 percent (DOF 2001). This anticipated increase is directly related to the increased employment opportunities in the eastern portion of Alameda County, as well as diversification of the San Joaquin County economy. Residential development and population increases in the southern part of San Joaquin County are anticipated to continue because commute times from San Joaquin County to Alameda County are similar to other Bay Area commute times. In addition, housing is less expensive and land more readily available in San Joaquin County than in Alameda County.

Contra Costa County

In 2000, the population of Contra Costa County was 948,816 (Census 2002a). During the 10-year period from 1990 through 2000, the population increased 18.1 percent. From 2000 through 2015, Contra Costa County is expected to grow by approximately 160,000 residents, an increase of 16.8 percent (DOF 2001). Growth during this period may be constrained by a lack of land suitable or available for development.

Stanislaus County

In 2000, the population of Stanislaus County was 446,997 (Census 2002a). During the 10-year period from 1990 through 2000, the population increased 20.6 percent, the highest growth rate of the four counties in the ROI. From 2000 through 2015, Stanislaus County is expected to grow by approximately 200,000 residents, an increase of 44.7 percent, similar to the expected growth rate of San Joaquin County (DOF 2001). This anticipated increase is directly related to the increased employment opportunities in the eastern portion of Alameda County, as well as diversification of the Stanislaus County economy. Residential development and population increases in the northwestern part of Stanislaus County are anticipated to continue because of its proximity to Bay Area businesses, less expensive housing than Bay Area counties, and readily available land.

4.3.3 Housing

Alameda County

The Alameda County housing stock (all units) totaled 546,735 units as of January 2002 (Table 4.3.3–1). The vacancy rate in Alameda County was 3.0 percent, indicating a low percentage of available housing. The total number of housing units increased 4.9 percent between 1997 and 2002 (DOF 2002). The overall county rate of housing growth is fairly moderate; however, this figure is not indicative of the higher subregional rate of housing growth in the eastern portion of the county (Tri-Valley area). The high rate of housing growth in the cities of Livermore, Dublin, and Pleasanton, in comparison to Alameda County, is the result of job growth in the Tri-Valley area and the availability of land.

TABLE 4.3.3–1.—*Housing Units and Vacancy Rates Within the Four-County Region of Influence and Selected Cities, 1997 – 2002*

County	1997			2002			% Housing Unit Growth (1997 – 2002)
	Housing Units	Occupied	% Vacant	Housing Units	Occupied	% Vacant	
Alameda	521,101	495,598	4.9	546,735	530,115	3.0	4.9
San Joaquin	182,444	173,439	4.9	197,279	189,512	3.9	8.1
Contra Costa	342,980	325,659	5.1	361,748	351,134	2.9	5.5
Stanislaus	147,088	139,688	5.0	156,515	150,649	3.7	6.4
City							
Livermore	24,524	23,558	3.9	27,357	26,856	1.8	11.6
Tracy	15,953	14,687	7.9	20,571	20,040	2.6	28.9
Pleasanton	22,085	21,090	4.5	24,517	23,845	2.7	11.0
Manteca	15,616	15,011	3.9	18,649	18,023	3.4	19.4
Modesto	65,693	62,542	4.8	69,848	67,540	3.3	6.3
Brentwood	4,874	4,590	5.8	9,784	9,419	3.7	100.7
San Ramon	16,087	15,272	5.1	17,917	17,296	3.5	11.4
Stockton	79,420	75,333	5.1	84,266	80,722	4.2	6.1
Dublin	7,949	7,731	2.7	11,107	10,496	5.5	39.7
Oakland	154,640	144,285	6.7	158,607	151,843	4.3	2.6

Source: DOF 2002.

Based on the distribution of LLNL employee residences shown in Table 4.3.2–1, and assuming one worker per household, LLNL workers (including LLNL employees, other Federal employees, and contractors) occupy approximately 5,883 housing units in Alameda County.

San Joaquin County

The San Joaquin County housing stock (all units) totaled 197,279 units as of January 2002 (Table 4.3.3–1). The vacancy rate in the county was 3.9 percent, indicating a moderate percentage of available housing. The total number of housing units in the county increased 8.1 percent between 1997 and 2002 (DOF 2002). The overall county rate of housing growth is fairly rapid as Bay Area workers seek lower housing prices. Tracy, in particular, has experienced a rapid housing growth of 28.9 percent from 1997 through 2002.

Based on the distribution of LLNL employee residences shown in Table 4.3.2–1, and assuming one worker per household, LLNL workers (including LLNL employees, other Federal employees, and contractors) occupy approximately 5,883 housing units in San Joaquin County.

Contra Costa County

The Contra Costa County housing stock (all units) totaled 361,748 units as of January 2002 (Table 4.3.3–1). The vacancy rate in the county was 2.9 percent, indicating a low percentage of available housing. The total number of housing units in the county increased 5.5 percent between 1997 and 2002 (DOF 2002). The overall county rate of housing growth is fairly moderate; however, this figure is not indicative of the higher subregional rate of housing growth in the eastern portion of the county. For example, Brentwood grew a total of 101 percent from 1997 through 2002.

Stanislaus County

The Stanislaus County housing stock (all units) totaled 156,515 units as of January 2002 (Table 4.3.3–1). The vacancy rate in the county was 3.7 percent, indicating a moderate percentage of available housing. The total number of housing units in the county increased 6.4 percent between 1997 and 2002 (DOF 2002). As with San Joaquin County, the overall county rate of housing growth in Stanislaus County is fairly rapid as Bay Area workers seek lower housing prices and the county economy continues to diversify and create additional jobs.

4.3.4 Economic Factors

Alameda and Contra Costa counties had a total of 69,993 business establishments in 2001, with a combined annual payroll of $38.7 billion (including LLNL) (Table 4.3.4–1). This figure is lower than the total personal income listed for Alameda and Contra Costa counties in Table 4.3.1–1, in that personal income includes income from many sources, such as wages, pensions, alimony, and interest. The services industry was the largest employment sector, with a $15 billion total payroll (EDD 2002c).

San Joaquin County had 12,920 business establishments in 2001. Payroll for these companies totaled $5 billion (Table 4.3.4–1). The services industry was the largest employment sector, with a $1.5 billion total payroll (EDD 2002c).

Stanislaus County had 11,276 business establishments in 2001. Payroll for these companies totaled $4.1 billion (Table 4.3.4–1). The services industry was the largest source of revenue, with a $1.4 billion total payroll (EDD 2002c).

TABLE 4.3.4–1.—*Annualized Payroll for Four-County Region of Influence by Industry Sector, 2001 ($1,000)*

	Alameda/Contra Costa [a]	San Joaquin	Stanislaus
Agriculture	$102,860	$346,260	$272,492
Mining	$350,836	$10,740	$776
Utilities	$222,976	$65,700	$11,764
Construction	$3,493,652	$511,460	$384,844
Manufacturing	$6,194,008	$830,308	$893,384
Wholesale trade	$2,898,288	$281,700	$212,284
Retail trade	$3,356,488	$588,760	$505,948
Transportation and warehousing	$1,484,200	$409,728	$120,728
Information	$2,536,288	$138,344	$70,676
Finance and insurance	$2,260,504	$235,992	$151,368
Real estate rental and leasing	$655,652	$66,392	$40,804
Services	$15,115,788	$1,489,472	$1,410,480
Total	**$38,671,540**	**$4,974,856**	**$4,075,548**

Source: EDD 2002c.
[a] Combined Oakland Metropolitan Statistical Area.

As of the last quarter of fiscal year (FY) 2002, LLNL had a monthly payroll of approximately $59 million. LLNL payroll originates entirely from the Livermore Site in Alameda County, even though some personnel are located at Site 300 in San Joaquin County. The total annual LLNL payroll for FY2002 was approximately $668 million, not including temporary labor and contractor personnel (LLNL 2002b). This amount represents 1.7 percent of the total combined payroll generated by all business establishments in Alameda and Contra Costa counties.

LLNL also contributes considerably to this region's economy through its direct purchases of goods and services. LLNL purchased a total of $568 million in goods and services in FY2001. Of that total, more than half ($348 million) was purchased in California. Of the amount purchased in California, $142 million in goods and services were purchased in the Bay Area (LLNL 2002c).

LLNL jobs and expenditures generate indirect jobs in the region. The Regional Input-Output Modeling System (RIMS) II economic model produces two multipliers that are useful for the evaluation of economic effects (BEA 2003). The first multiplier is used to calculate worker earnings, and the second calculates employment. These multipliers provide information needed to estimate LLNL's economic impact. Earnings and employment multipliers make possible the identification of not only the direct impacts of an activity on regional income and jobs, but also the indirect effects. Based on the FY2002 LLNL payroll of $668 million, the regional earnings

multiplier of 1.64 yields an overall economic effect of $1,096 million within the ROI. Based on the total LLNL direct employment and the regional employment multiplier of 1.97, an estimated total of 17,400 jobs in the ROI are attributable to LLNL. In effect, one out of every 95 jobs (or 17,400 out of 1,644,500) in the ROI is directly or indirectly attributable to LLNL.

4.3.5 Environmental Justice

Environmental Justice has been defined as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies (EPA 2002a). Concern that minority and/or low-income populations might be bearing a disproportionate share of adverse health and environmental impacts led President Clinton to issue an Executive Order (EO) in 1994 to address these issues (59 *Federal Register* [FR] 7629). That order, EO 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," directs Federal agencies to make Environmental Justice part of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations. When conducting NEPA evaluations, the NNSA incorporates Environmental Justice considerations into both its technical analyses and its public involvement program in accordance with the U.S. Environmental Protection Agency (EPA) and the Council on Environmental Quality (CEQ) regulations (CEQ 1997).

NNSA selected an area within 50 miles of the Livermore Site and Site 300 for analysis, an area that encompasses all or portions of 19 counties (Table 4.3.5–1). This radius was selected to be consistent with possible effects evaluated as part of the air impacts and accident consequence analyses.

4.3.5.1 *Identifying Minority and Low-Income Populations*

Demographic information from the U.S. Census Bureau was used to identify minority and low-income populations within 50 miles of LLNL (Census 2001). Information on locations and numbers of minority populations was obtained from the 2000 census; information on low-income populations was developed from 1999 incomes reported in the 2000 census. Census data are reported on the level of block groups, a geographical area that varies with size depending largely on population density (low-population density block groups generally cover larger geographical areas). Areas of minority or low-income populations are identified based on comparing the percentage of individuals who are minority or low-income within a block group with the average percentages for the State of California.

For this LLNL SW/SPEIS, minority populations are considered to be all *people of color*, which includes all ethnic and racial groups except non-Hispanic whites. For California, the minority population is 53.3 percent. Figure 4.3.5–1 shows the locations of block groups within 50-miles of each LLNL site where the minority population is greater than 53.3 percent.

For this LLNL SW/SPEIS, low-income populations are those individuals living below the poverty threshold, as defined by the 2000 census. This threshold varies from an annual household income of $8,259 to $38,138, depending on the number and age of household

members. For California, the percent of the population living in poverty is 14.2 percent. Figure 4.3.5–2 shows the location of block groups within 50 miles of each LLNL site where the low-income population is greater than 14.2 percent.

TABLE 4.3.5–1.—*Summary of Minority and Low-Income Populations within 50 Miles of the Livermore Site and Site 300*

	Livermore Site			Site 300		
County	**Population**	**Minorities[a]**	**Low-Income[b]**	**Population**	**Minorities[a]**	**Low-Income[b]**
Alameda	1,443,741	852,646	159,219	1,443,741	852,646	159,219
Amador	—	—	—	1,466	238	227
Calaveras	—	—	—	12,476	2,055	1,146
Contra Costa	950,017	399,598	72,307	947,683	397,301	71,563
Marin	149,192	35,453	10,186	—	—	—
Merced	16,099	6,205	2,645	47,720	26,952	9,162
Napa	17,383	6,990	1,245	—	—	—
Sacramento	39,803	15,427	3,785	42,136	16,048	3,903
San Benito	—	—	—	3,399	1,427	314
San Francisco	776,733	437,824	87,908	406,806	256,994	58,629
San Joaquin	563,598	296,596	98,978	563,598	296,596	98,978
San Mateo	707,161	354,806	41,229	537,818	242,838	31,706
Santa Clara	1,682,585	938,303	126,408	1,682,585	938,303	126,408
Santa Cruz	96,502	18,064	6,961	77,026	16,496	5,606
Solano	372,123	192,003	30,360	192,225	104,315	15,960
Sonoma	3,479	1,172	299	—	—	—
Stanislaus	436,483	187,264	69,856	446,997	190,996	71,197
Tuolumne	—	—	—	352	66	55
Yolo	1,375	676	185	676	389	83
Totals	7,256,274	3,743,027	711,571	6,406,704	3,343,660	654,156
Percent of Population		51.6%	9.8%		52.2%	10.2%

Source: Census 2001.

[a] For this LLNL SW/SPEIS, minority populations are considered to be all *people of color*, which includes all ethnic and racial groups except non-Hispanic whites.

[b] For this LLNL SW/SPEIS, low-income populations are considered to be those individuals living below the poverty threshold, as defined by the 2000 census.

4.3.5.2 *Livermore Site*

Minority Populations

A total population of 7,256,274 resides within a 50-mile radius of the Livermore Site. Of these, 3,743,027, or 51.6 percent, are minorities. This percentage is less than the State of California as a whole. As shown in Figure 4.3.5–1, there are no block groups within a 5-mile radius that are categorized as minority. A very small area of Alameda County, approximately 10 miles west of the Livermore Site, is categorized as minority. Within 20 miles, higher concentrations of minorities are found within portions of western Alameda County and San Joaquin County in the Central Valley.

Low-Income Populations

Of the total population of 7,256,274 within 50 miles of the Livermore Site, 711,571, or 9.8 percent, are low income. This percentage is less than the State of California as a whole. As shown in Figure 4.3.5–2, there are no block groups within a 10-mile radius of the Livermore Site that have percentages of low-income populations greater than the state average. Within 20 miles, some higher concentrations of low-income populations are located in the eastern portion of Contra Costa County, San Joaquin County, the southwestern portion of Alameda County, and the northern portion of Santa Clara County.

4.3.5.3 *Site 300*

Minority Populations

A total population of 6,406,704 resides within a 50-mile radius of Site 300. Of these, 3,343,660, or 52.2 percent, are minorities. This percentage is less than the State of California as a whole. As shown in Figure 4.3.5–1, there are no block groups within a 5-mile radius that are categorized as minority. Several areas of San Joaquin County, approximately 9 miles north and northeast of Site 300, are categorized as minority. Within 20 miles, higher concentrations of minorities are found within western portions of San Joaquin and Stanislaus counties in the Central Valley.

Low-Income Populations

Of the total population of 6,406,704 within 50 miles of Site 300, 654,156, or 10.2 percent, are low income. This percentage is less than the State of California as a whole. As shown in Figure 4.3.5–2, there are no block groups within a 5-mile radius of Site 300 that have percentages of low-income populations greater than the state average. Within 10 miles, two areas of western San Joaquin County, to the north and northeast of Site 300, are categorized as low income. Within 20 miles, some higher concentrations of low-income populations are located in the western portions of San Joaquin and Stanislaus counties and the northern portion of Santa Clara County.

4.4 COMMUNITY SERVICES

This section describes the existing demands on fire protection and emergency services, police protection and security services, school services, and nonhazardous solid waste disposal from the operation of LLNL. Appendix I contains a more detailed discussion of emergency preparedness planning and response and mutual assistance agreements.

4.4.1 Fire Protection and Emergency Services

The existing fire protection and emergency services at LLNL are provided by the LLNL Emergency Management Division and by offsite fire protection agencies through mutual aid agreements.

4.4.1.1 Livermore Site

Onsite Facilities

The Emergency Management Division at the Livermore Site occupies two facilities: a fire station at Building 323 (Fire Station No. 1) and an emergency dispatch center at Building 313. All Livermore Site health and safety alarms are received by the emergency dispatch center through the site-wide alarm system. In addition to monitoring the Livermore Site alarms and dispatching personnel, the emergency dispatch center serves as the mutual aid dispatch center for both the Twin Valley Mutual Aid Plan and the Alameda County Mutual Aid Plan. Requests for mutual aid are processed and appropriate mutual aid equipment is dispatched based on a standard response schedule. The LLNL fire chief is the mutual aid coordinator for the Twin Valley Mutual Aid Plan and the Alameda County Mutual Aid Plan.

There are about 62 fire protection and emergency services personnel at LLNL in the following categories: fire protection engineering and fire prevention, training, emergency dispatch, and emergency operations. Personnel are rotated between the Livermore Site fire station and the Site 300 fire station (Fire Station No. 2). The minimum staff level for the Livermore Site (Fire Station No. 1) is eight nonmanagement personnel and one chief officer on call 24 hours per day.

Onsite Fire Apparatus Description and Replacement Schedule

LLNL Fire Station No. 1 is equipped with four large-capacity pumpers (1,000 to 1,500 gallons per minute), including one ladder truck and one four-wheel drive; one smaller capacity (325 gallons per minute) four-wheel drive pumper; a special services unit with hazardous material containment equipment; two ambulances; and three command vehicles.

A fire apparatus replacement schedule, which covers a rolling 5-year period, is updated on a yearly basis. Each apparatus has a planned lifespan and replacement date. Amendments are made annually to reflect changes or additions in the replacement schedule. Adequate funding for replacement apparatus is available.

Onsite Emergency Procedures

LLNL has compiled its general emergency response policies and procedures for the Livermore Site into the Emergency Plan (LLNL 2003a). The plan provides an overview of emergency response procedures for LLNL management and for major departments and programs. Appendix I contains a more detailed discussion of the Emergency Plan.

Onsite Emergency Response Characteristics

The average Livermore Site Fire Department response time onsite is 3.5 minutes. One vehicle and four personnel will initially respond to a call onsite. Additional equipment and personnel will respond as needed. Table 4.4.1.1–1 provides a summary of the numbers and types of onsite emergency calls to which the LLNL fire safety division responded from 1999 through 2002 (LLNL 2003b).

TABLE 4.4.1.1–1.—*Summary of Emergency Response Calls for 1999 through 2002*

Type of Incident	Number of Incidents							
	1999		2000		2001		2002	
	Livermore Site	Site 300[a]	Livermore Site	Site 300[a]	Livermore Site	Site 300[a]	Livermore Site	Site 300[a]
Ambulance	141		120		142		196	
Fire	466		319		341		394	
Hazardous materials	74		66		69		61	
Mutual/automatic aid[b]	683		668		1,079[c]		885[c]	
Total	**1,364**	**59**	**1,173**	**68**	**1,631**	**59**	**1,536**	**65**

Source: LLNL 2003b.

[a] Site 300 emergency response calls are not categorized by incident type.

[b] Includes responses under agreements with offsite agencies.

[c] Increase from previous years primarily due to expansion of service area and calls on and after September 11, 2001.

At the Livermore Site, the ambulances transport patients to a medical facility that offers care commensurate with the severity of the injury (based on evaluation using emergency medical service protocols). These facilities include the onsite Health Services Department, Valley Care Medical Center (Pleasanton), or Eden Medical Center (Castro Valley).

Offsite Agency Involvement

The LLNL Emergency Management Division participates in several automatic and mutual aid agreements with various offsite agencies. Automatic aid is dispatched offsite without request on a first alarm. Mutual aid assistance is specifically requested after local agency resources have been depleted. LLNL participates in automatic and mutual aid agreements with the Livermore-Pleasanton Fire Department and the Alameda County Fire Patrol, respectively. LLNL participates in a mutual aid network that extends throughout the state of California.

The LLNL Fire Department responds to approximately 300 of the Livermore-Pleasanton Fire Department's total annual calls. Conversely, the Livermore-Pleasanton Fire Department responds to three of the Livermore Site's total annual calls. LLNL responds to an average of 300 Alameda County Fire Patrol calls per year; the Alameda County Fire Patrol typically is not

called on to respond to LLNL calls. The California Department of Forestry, which provides mutual aid to Site 300, does not respond to mutual aid requests at the Livermore Site because it does not maintain structural fire equipment. The Livermore Site fire station assists with approximately three wildland fires per year within the California Department of Forestry's jurisdiction. This constitutes less than 1 percent of the California Department of Forestry's total annual calls (LLNL 2003b).

Offsite Facilities

The mutual and automatic aid agreements between the LLNL Fire Department and the local fire departments are based on the concept that the closest emergency aid responds to the call. For example, the LLNL Fire Department would respond, along with the Livermore-Pleasanton Fire Department, to a call at the Graham Court warehouse, the Research Drive offices, or the Almond Avenue school site.

4.4.1.2 Site 300

Onsite Facilities

LLNL Fire Station No. 2 is located in Building 890 at Site 300. This facility is part of the overall Emergency Management Division of LLNL and is operated under the direction of the LLNL fire chief. At a minimum, four personnel are on duty 24 hours a day at Fire Station No. 2. One chief officer, who is responsible for Site 300, is on call at the Livermore Site during normal business hours and from an offsite residence outside of normal business hours.

Onsite Fire Apparatus Description

LLNL Fire Station No. 2 is equipped with two large (1,000 and 1,250 gallons per minute) pumpers, the smaller of which is four-wheel drive; one smaller four-wheel drive pumper (325 gallons per minute); and one ambulance.

Onsite Emergency Procedures

LLNL has compiled its general emergency response policies and procedures for Site 300 into the Site 300 Emergency Plan (LLNL 2003c). Appendix I contains a more detailed discussion of the Site 300 Emergency Plan.

The dispatcher at Building 313, who dispatches fire personnel and equipment from Fire Station No. 2, monitors alarms at Site 300. The Livermore Site Emergency Dispatch Center dispatches additional resources from the LLNL Fire Station No. 1 if necessary.

Onsite Emergency Response Characteristics

The average Site 300 fire station response time onsite is 4.5 minutes. One vehicle and four personnel respond from the Site 300 fire station. In addition, a vehicle from the Livermore Site responds as a "cover" in case an additional fire breaks out. The minimum response time to the Site 300 main gate from the Livermore Site is 15 minutes. Table 4.4.1.1–1 provides the number of onsite emergency calls to which the Site 300 Fire Department from 1999 through 2002.

At Site 300, the ambulance transports patients to a medical facility that offers care commensurate with the severity of the injury (based on evaluation using emergency medical service protocols). These facilities include the Sutter Hospital in the city of Tracy or the nearest trauma center.

Offsite Agency Involvement

The LLNL Emergency Management Division maintains mutual aid agreements with several agencies that could serve Site 300, including the city of Tracy and the California Department of Forestry.

The city of Tracy Fire Department and the Site 300 fire station typically do not request aid from each other. The Site 300 fire station has not historically responded to calls within the Tracy Rural County Fire Protection District's jurisdiction. Conversely, the Tracy Rural County Fire Protection District typically receives one call annually from Site 300. The California Department of Forestry and the Site 300 fire station respond to an average of less than three of each other's calls per year (LLNL 2003b).

4.4.2 Police Protection and Security Services

This section presents an overview of onsite security services at LLNL. The existing police protection and security services provided by offsite agencies participating in emergency response agreements with LLNL are also discussed.

Onsite Activities

The Office of Investigative Services and Protective Force Division of the Safeguards and Security Department provide police protection and security services at LLNL. It is the function of the Protective Force Division to provide protection for LLNL personnel and assets. This protection is provided through several channels, including access control, fixed access and surveillance points, random vehicle and foot patrols, response elements, and special response team elements.

Emergency Response Characteristics

The Protective Force Division provides emergency response service to the Livermore Site and Site 300 and has contingency plans to cover credible emergencies, including work stoppages, bomb threats, natural disasters, site-wide evacuations, callout procedures, satellite command center activation procedures, executive protection, alarm response procedures, and civil disorders.

Offsite Agency Involvement

LLNL participates in emergency response agreements with the Livermore Police Department, the Alameda County Sheriff's Department, the San Joaquin County Sheriff's Department, the California Highway Patrol (CHP), and the Federal Bureau of Investigation (FBI). Offsite agencies generally provide first alarm response to LLNL offsite leased properties (LLNL 2002bz).

The Livermore Police Department is rarely requested to respond to calls at the Livermore Site through its emergency response agreement. The Alameda County Sheriff's Department responds to an average of six calls at the Livermore Site per year, which is less than 1 percent of the agency's total annual calls. Site 300 is within Patrol District 8 of the San Joaquin County Sheriff's Department. LLNL did not request assistance from the Sheriff's Department during 2001. The CHP responds to calls from the Protective Force Division during large-scale demonstrations that have the potential to block Vasco Road and Greenville Road. The CHP responds to calls for crowd control from the Protective Force Division on an average of once per year. There is occasional interaction with the FBI for criminal and security investigations (LLNL 2002bz).

4.4.3 School Services

In the 2001 – 2002 school year, student enrollment totaled 606,967 (Table 4.4.3–1) in the four-county ROI described in Section 4.3. The local school district is the Livermore Valley Joint Unified School District and includes schools from kindergarten through high school. This district serves approximately 14,000 students from a 240-square-mile area that includes the city of Livermore. Neither LLNL nor the Livermore Valley Joint Unified School District tracks the number of children of LLNL employees that attend district schools. Based on the number of LLNL employees and other LLNL workers residing within Livermore (see Section 4.3.1 and Table 4.3.2–1), and the percentage of the Livermore population attending Livermore Valley Joint Unified School District schools, it is calculated that approximately 2,090 children of LLNL workers attend schools within the district.

TABLE 4.4.3–1.—*School Enrollment in the Four-County Region of Influence*

	Alameda	San Joaquin	Contra Costa	Stanislaus	ROI
Total school enrollment	217,591	127,354	161,742	100,280	606,967

Source: California Department of Education 2003.

4.4.4 Nonhazardous and Nonradioactive Solid Waste Disposal

This section discusses only nonhazardous and nonradioactive solid waste disposal. Disposal of hazardous and radioactive waste generated at LLNL is discussed in Section 4.15.2.

Livermore Site

Description of Landfill Facilities

Nonhazardous solid waste generated at the Livermore Site is transported to the Altamont Landfill for disposal (LLNL 2003bd). The landfill is estimated to have sufficient capacity to receive waste until the year 2038 (Hurst 2003). The current total daily permitted throughput at the Altamont Landfill is 11,150 tons per day (SWIS 2002).

Plans for Expansion of Onsite Facilities

There are no plans to expand the Livermore Site nonhazardous solid waste storage facilities or to modify nonhazardous waste disposal methods.

Onsite Solid Waste Characteristics

During 2002, of the 15,300 tons of nonhazardous waste generated at the Livermore Site, approximately 5,650 tons were collected and transported to the Altamont Landfill from the Livermore Site (LLNL 2003bd). Construction waste made up approximately two-thirds of this total, and the remaining one-third consisted of paper, plastics, glass, other organics, and other wastes. Livermore Site waste is collected in 222 onsite containers with average volume capacities of 4 cubic yards each (LLNL 2003bd). LLNL disposes of waste daily at the Altamont Landfill. Waste is collected and disposed of daily from 178 of the containers, twice weekly from 31 of the containers, weekly from 10 of the containers, and monthly from 3 of the containers.

Waste Reduction and Recycling Programs

In 2002, LLNL diverted more than 60 percent of its 15,300 tons of nonhazardous waste for recycling and reuse. A portion of the nonhazardous waste generated annually is sold, including cardboard containers and metals. Additionally, soil is reused at the Livermore Site and for daily cover at the Altamont landfill (LLNL 2002cc). Approximately 560 tons of landscape clippings were composted in 2002 (LLNL 2003bd).

Site 300

During 2002, approximately 200 tons of nonhazardous solid waste was transported from Site 300. The waste generated at Site 300 is collected from 3 to 5 times per month and transported to the Tracy Material Recovery and Solid Waste Transfer Station, a facility where waste is sorted for recycling. A 16-cubic-yard trash truck (compactor), which can carry 3 to 4 tons per load, collects waste an average of two times per month. A 10-cubic-yard dump truck collects waste an average of one time per month (LLNL 2003bd).

Site 300 has waste reduction and recycling programs in effect, including cardboard, paper, and metal salvage activities. Waste is also sorted at the disposal site for recycling (LLNL 2003bd).

4.5 PREHISTORIC AND HISTORIC CULTURAL RESOURCES

This section provides a summary evaluation of the prehistoric and historic cultural resources on the Livermore Site and Site 300. Paleontological resources, or fossils, are discussed in Section 4.8. Cultural resources include prehistoric, Native American, and historic resources.

Prehistoric resources are physical properties resulting from human activities that predate written records and are generally identified as isolated finds or sites. Prehistoric resources can include village sites, temporary camps, lithic scatters, roasting pits/hearths, milling features, petroglyphs, rock features, and burials.

Native American resources are sites, areas, and materials important to Native Americans for religious, spiritual, or traditional reasons. These resources are also known as Traditional Cultural Properties. These resources may include villages, burials, petroglyphs, rock features, spring locations, or natural geologic formations. Fundamental to many Native American religions is the belief in the sacred character of physical places, such as mountain peaks, springs, or burials. Traditional rituals may also prescribe the use of particular native plants, animals, or minerals. Therefore, activities that may affect sacred areas, their accessibility, or the availability of materials used in traditional practices are a primary concern. Interested Native American parties identified by the California Native American Heritage Commission were contacted with the result that no Traditional Cultural Properties are known to exist at LLNL.

Historic resources consist of physical properties, structures, or built items resulting from human activities that postdate written records. Historic resources can include archaeological remains, standing buildings and architectural structures, and historic landscapes. Historic archaeological site types include town sites, homesteads, agricultural or ranching features, mining-related features, refuse concentrations, and features or artifacts associated with early military use of the land. Historic architectural resources can include houses, cabins, barns, and lighthouses; local structures, such as churches, post offices, and meeting halls; and early military structures, such as hangars, administration buildings, barracks, officer's quarters, warehouses, and guardhouses. Structures or engineering features associated with scientific or technological developments, or buildings or objects that relate to programs associated with political eras such as the Cold War, may also represent historic resources.

4.5.1 Federal Regulations Related to Cultural Resources

The *National Historic Preservation Act* (NHPA) of 1966 (16 U.S.C. §470 et seq.), and subsequent amendments, is the basis for a process that Federal agencies such as the NNSA use to consider the effects of projects on significant cultural resources. The procedure an agency follows to achieve compliance with this legislation is commonly called the Section 106 process. Although the NHPA was created primarily in response to numerous federally funded urban renewal projects that demolished old neighborhoods and historic homes, it applies to any action an agency may take that will affect historic or cultural resources as they are defined in the law. The most recent guidelines were put into effect January 11, 2001, and essentially define a Section 106 process that places primary responsibility on the involved Federal agency. Other laws governing cultural resources include the *Archaeological and Historic Preservation Act* of 1974 (16 U.S.C. §469), the *Archaeological Resources Protection Act* (ARPA) of 1979 (16 U.S.C. §470 aa-mm), and their implementing regulations. The primary purpose of the NHPA is to require Federal agencies to consider the effects of their actions on properties listed, or

eligible for listing, in the National Register of Historic Places (NRHP). Federal eligibility criteria for NRHP listing are included in Appendix G.

Federal agencies are also required to consult with recognized Native American tribes regarding the potential effects of the project on Native American resources or Traditional Cultural Properties. NNSA has conferred with the California Native American Heritage Commission (Appendix G) to define a list of appropriate Native American representatives to contact, and has consulted with eleven representatives of Ohlone/Costanoah groups. No Traditional Cultural Properties have been identified on the Livermore Site or Site 300.

4.5.2 Prehistoric Resources

Livermore Site

Field surveys and records searches conducted prior to and for the 1992 LLNL Environmental Impact Statement/Environmental Impact Report (EIS/EIR) did not reveal the presence of prehistoric resources on the Livermore Site (LLNL 1992a). Previous work included archival reviews conducted at the California Archaeological Inventory at Sonoma State University; the California Archaeological Inventory at California State, Stanislaus; a records search at Basin Research Associates in San Leandro, California; and review of the archaeological files at LLNL (LLNL 1992a). In addition, field surveys conducted by Holman & Associates in the undeveloped western and northern perimeter areas, including a 500-foot-wide buffer, and an undeveloped area survey conducted in 1991 did not reveal the presence of prehistoric resources (LLNL 1992a).

Because most of the Livermore Site is developed, the likelihood of finding unrecorded and undisturbed prehistoric sites is low; however, there is still the possibility that undisturbed prehistoric sites lay buried under the modern landscaping.

Site 300

Site 300 has been surveyed for both prehistoric and historic cultural resources, and a number of potentially significant prehistoric sites have been identified (LLNL 1992a). Further investigation and delineation of the known resources has resulted in the establishment of four archaeological sensitivity areas that contain these prehistoric cultural resources (LLNL 2002bj). The resources include rock shelters and other areas used for making stone tools. No formal subsurface testing program has occurred and formal NRHP eligibility determinations are incomplete. Development or ground disturbing activities have not been permitted in or within 300 feet of the delineated areas unless the activity was approved or monitored by LLNL archaeologists (LLNL 2002bj). It is likely the subsurface prehistoric cultural resources exist at Site 300. This is because prehistoric resources are known to exist at the site, and much of the site is undeveloped.

4.5.3 Historic Resources

Livermore Site

The Livermore Site has a number of buildings associated with historic events or significant LLNL achievements. These include buildings from the World War II-era Livermore Naval Air Station as well as buildings built after 1952. Some of the buildings and facilities, or groups of facilities, at the Livermore Site, may be eligible for listing in the NRHP. To facilitate evaluation of the properties, an historic context is being developed and analysis of specific individual properties is in progress (LLNL 2002bj).

To date, DOE and the State Historic Preservation Officer (SHPO) have evaluated and concurred that 52 buildings are not eligible for listing on the NRHP. The negative or not eligible determinations include the following buildings: 177, 222, 251, 317, 328A, 412, 431, 490, 592, 593, 1253, 1477, 1478, 1482, 1601, 1602, 1631, 1734, 1877, 2512, 2527, 2529, 2530, 2629, 2685, 2687, 2626, 2801, 2802, 2808, 3629, 3703, 3751, 3777, 3903, 3904, 3905, 3907, 3982, 4107, 4180, 4302, 4377, 4378, 4383, 4384, 4387, 4388, 4440, 4442, 8011, and 8806 (LLNL 2002bj, LLNL 2003ca).

Site 300

Field surveys and archival research conducted prior to and for the 1992 LLNL EIS/EIR revealed the presence of potentially eligible historic archaeological resources at Site 300. Most notable is CA-SJO-173H, the Carnegie townsite, associated with the Carnegie Brick and Pottery Company founded in 1895. The site has components and material remains that are within the Site 300 boundaries and it has been determined that places associated with Carnegie are considered eligible for the NRHP.

Following the 1992 LLNL EIS/EIR, additional investigation and delineation of known resources by LLNL has resulted in the establishment of 17 archaeological sensitivity areas that contain historic cultural resources (LLNL 2002bj). Development or ground-disturbing activities have not been permitted in or within 300 feet of the delineated areas unless approved or monitored by LLNL archaeologists (LLNL 2002bj).

4.6 AESTHETICS AND SCENIC RESOURCES

The scenic quality or character of an area consists of the landscape features and social environment from which they are viewed. The landscape features that define an area of high visual quality may be natural, such as mountain views, or man-made, such as city skyline. To assess the quality of visual resources in the project area, this section describes the overall visual character and distinct visual features on or in the view shed of the Livermore Site and Site 300.

4.6.1 Scenic Resources Policies

The Landscape Architecture Master Plan for LLNL provides guidance for development at LLNL (LLNL 2002d). Because there are no strict standards at LLNL for matching exterior building color or style, the landscape architecture planning process is the only means of creating cohesiveness in image. The Landscape Architecture Master Plan is intended to ensure that all site improvements are architecturally compatible with their immediate surroundings and that other aesthetic qualities, such as temperature, wind, and glare are moderated.

The Livermore Site is within Alameda County. In addition, the western 1,100 feet of the Livermore Site is within the city of Livermore. Most of Site 300 is within San Joaquin County, with a small portion in Alameda County. The surrounding cities and counties have no planning jurisdiction for the site because LLNL is a Federal facility owned by DOE. Nevertheless, as a good neighbor policy, LLNL does consider local planning policies, to the extent practicable, in its land decisions. An overview of the relevant scenic resource policies of the surrounding jurisdictions is provided below.

Alameda County

East County Area Plan

The East County Area Plan of the Alameda County General Plan presents Alameda County's intent regarding future development and resource conservation in the East County area (Alameda County 1994). The East County Area Plan provides specific visual resource goals and policies as well as specific implementation programs to achieve the goals and policies. The East County Area Plan also provides specific guidance as to preservation of sensitive view sheds and scenic corridors. Policies relevant to the Livermore Site or Site 300 are summarized in Table 4.6.1–1.

TABLE 4.6.1–1.—*Visual Resource Policies of the East County Area Plan Relevant to the Livermore Site or Site 300*

	Trees
Policy 110	Alameda County shall require that developments are sited to avoid or, if avoidance is infeasible, to minimize disturbance to large stands of mature, healthy trees and individual trees of notable size and age.
Policy 111	Alameda County shall not allow any structure to exceed the height of the tree canopy in woodland areas.
	Landscaping
Policy 114	Alameda County shall require the use of landscaping…to enhance the scenic quality of the area and screen undesirable views.
Policy 115	In all cases appropriate…landscaping and screening shall be required to minimize the visual impact of development…To the maximum extent practicable, all exterior lighting must be located, designed, and shielded so as to confine direct rays to the parcel where lighting is located.
	Utilities
Policy 120	Alameda County shall require that utility lines be placed underground whenever feasible. When located aboveground, utility lines and supporting structures shall be sited to minimize their visual impact.

Source: Alameda County 1994.

Scenic Route Element of the Alameda County General Plan

The Alameda County Board of Supervisors adopted the scenic route element of the Alameda County General Plan in May 1966. The East County Area Plan recommends an update to the scenic route element but this task has not been completed. The scenic route element serves as a guide for establishment of programs and legislation for the development of a system of scenic routes. A primary goal of the element is the preservation and enhancement of scenic qualities and natural scenic areas adjacent to and visible from scenic routes. The element contains objectives, definitions, policies, standards, and implementation measures (Alameda County 1966).

Scenic routes are defined as consisting of three elements: the right-of-way (ROW), the adjacent scenic corridor, and areas extending beyond the scenic corridor. Scenic corridors are described in two ways: (1) areas that extend beyond a scenic route ROW and are of sufficient scenic quality to be acquired by state or local jurisdictions, and (2) areas to which development controls should be applied to preserve and enhance nearby views or maintain unobstructed distant views along a scenic route and provide a pleasant route of travel (Alameda County 1966).

The following roadway segments in the vicinity of the Livermore Site are designated as scenic routes in the scenic route element of the Alameda County General Plan:

- I-580
- Vasco Road
- Patterson Pass Road (from Vasco Road to the San Joaquin County border)
- Tesla Road (from Vasco Road to the San Joaquin County border)
- Greenville Road (from I-580 to Tesla Road)

- Altamont Pass Road (from I-580 to Route 239)
- Cross Road (from Patterson Pass Road to Tesla Road)
- Flynn Road (from Patterson Pass Road to I-580)
- Mines Road

Figure 4.2.2.1–2, in Section 4.2.2.1, illustrates the scenic routes designated in the Alameda County scenic route element.

The visual resource preservation policies contained in the Alameda County scenic route element are similar to those described above for the East County Area Plan but are specific to designated scenic routes. These policies are summarized below.

- **Provide for normal uses of land and protect against unsightly features.** In both urban and rural areas, normally permitted uses of land should be allowed in scenic corridors, except that panoramic views and vistas should be preserved and enhanced by supplementing normal zoning regulations with special height, area and side-yard regulations and by providing architectural and site design review.
- **Use landscaping to increase scenic qualities of scenic route corridors.** Landscaping should be designed and maintained in scenic route corridors to provide added visual interest, to frame scenic views, and to screen unsightly views.
- **Use underground utility distribution lines when feasible and make overhead lines inconspicuous.** New, relocated, or existing utility distribution lines should be placed underground whenever feasible. When it is not feasible to place lines underground, they should be inconspicuous from the scenic route. Poles of an improved design should be used wherever possible. Combined or adjacent ROWs and common poles should be used wherever feasible.
- **Control tree removal.** As a means of preserving the scenic quality of the county, no mature trees should be removed without permission from the local jurisdiction.

City of Livermore

Livermore Community General Plan

The Livermore Community General Plan is the comprehensive, long-term general plan for the physical development of the city and any land outside city boundaries relevant to its long-range planning (City of Livermore 1975). The plan specifies a number of natural and man-made visual amenities that should be preserved including some near the Livermore Site and Site 300 (Table 4.6.1–2).

TABLE 4.6.1–2.—*Amenities Designated for Preservation in the Livermore Community General Plan*

Natural Amenities	Man-made Amenities
Ridgelines	Vineyards (i.e., Wente Winery and Concannon Winery)
Grasslands	Other agriculture
Corral Hollow	Buildings of historic or architectural interest (i.e., Tesla historical town site and coal mines)
	Scenic highways, roads, and corridors

Source: City of Livermore 1975.

Scenic Route Element of the Livermore General Plan

The scenic route element of the Livermore Community General Plan is designed to guide the preservation and enhancement of scenic values along streets and highways in the Livermore Valley. It also aims to preserve and enhance scenic values that are of outstanding quality or that provide access to important scenic, recreational, cultural, or historic points. Furthermore, the scenic route element provides a comprehensive plan and expands the scenic route plans of Alameda County and the California Department of Transportation within the Livermore planning area. The following roadway segments in the vicinity of the Livermore Site are designated as scenic routes in the city of Livermore's scenic route element (Figure 4.2.2.1–2) (City of Livermore 1975):

- I-580
- Greenville Road
- Tesla Road
- Altamont Pass Road
- Patterson Pass Road (east of Greenville Road)
- Flynn Road

The policies in the scenic route element of the city of Livermore Community General Plan are similar to those contained in the East County Area Plan (Alameda County 1994) and scenic route element of the Alameda County General Plan (Alameda County 1966). These policies address the use of landscaping to increase the scenic qualities of scenic corridors and encourage the use of underground utilities and the preservation of mature trees (City of Livermore 1975).

Scenic Highways Element of the San Joaquin County General Plan

The San Joaquin County Board of Supervisors adopted the scenic highways element of the San Joaquin County General Plan on October 19, 1978. The purpose of the element is to establish scenic routes in the county and guide the preservation and enhancement of scenic qualities and natural scenic areas adjacent to and visible from scenic routes (San Joaquin County 1978).

San Joaquin County recognized the value of scenic resources surrounding a 16-mile portion of I-580 and I-5 between Stanislaus and Alameda counties. In 1974, the county adopted a scenic corridor zone, designed to give aesthetic protection to county-designated scenic highways. Later in 1974, this 16-mile segment of I-580 and I-5 received official designation as a state scenic highway. No other highways or roadways within San Joaquin County have been identified as scenic. Figure 4.2.2.1–2 shows the location of a segment of the I-580 state scenic highway corridor within San Joaquin County.

4.6.2 Visual Character of the Project Area

Regional Character

Hills and mountains that define the regional view shed and provide open space around the development on the valley floor ring the Livermore Valley of eastern Alameda County, where the Livermore Site is located. The terrain in the vicinity of the sites ranges from relatively flat land to gently rolling hills. The hills east and south of the Livermore Site gradually become steeper as they trend eastward to form the Altamont Hills of the Diablo Range. Wind turbines north and south of the Altamont Pass punctuate the eastern horizon and have become part of the eastern valley landscape identity.

Site 300 is located in the Altamont Hills of the Diablo Range. This area is largely grasslands and low shrubs in areas ranging in topography from gently rolling hills to steeply sloping ridges and drainages. View sheds in the area around Site 300 are severely constrained by topography.

Livermore Site

The Livermore Site has a campus-like or business park-like setting with buildings, internal roadways, pathways, and open space. Portions of the site along the western and northern boundaries remain largely undeveloped and serve as security buffer zones. A row of eucalyptus and poplar trees surrounds much of the developed portion of the Livermore Site and screens most ground-level views of the facility. Onsite buildings range in height from 10 feet to approximately 110 feet. A 9-foot chainlink and barbed wire security fence surrounds the Livermore Site. The most prominent buildings in the public view shed are the administrative buildings off of East Avenue in the southwest corner of the site, the Sunshine building in the western portion of the site, and NIF in the northeast corner. These buildings are visible from locations along adjacent roads.

The area surrounding the Livermore Site is a mixture of rural and pastoral uses and urban development. SNL/CA is located immediately south of the Livermore Site. Rural residences and grazing land are the primary visual features to the east. Detached residences occupy the area west of the Livermore Site, giving the area a suburban character. A small area of commercial use occupies lands immediately southwest of LLNL. A mixture of vineyards and residential uses surrounds the commercial area, although residential development is currently underway and the visual character of the area is shifting from pastoral to suburban. The area north of the Livermore Site to I-580 is industrial, primarily one- and two-story industrial buildings, business parks, and the Union Pacific railroad line that traverses the area. This area is visually similar with the research, business, and industrial character of the Livermore Site.

Site 300

The main gate and the GSA of Site 300, including a number of buildings, roads, and infrastructure, are foreground and middle-ground features in view from Corral Hollow Road, which forms the southern boundary of Site 300. Vegetative screening and topography partially obscure many of the features associated with the GSA. The majority of Site 300 is obscured from view by topography.

The surrounding area is primarily undeveloped open space or rural, with some exceptions. Fireworks America is adjacent to and northeast of Site 300. Although the sign at the entrance to the facility is visible from Corral Hollow Road, structures associated with this facility are

obscured by topography. The SRI International Testing Facility is approximately 0.6 mile south of Site 300 and is not visible from Corral Hollow Road.

Carnegie State Vehicular Recreation Area, located south of the western portion of Site 300, is used by off-road vehicles. The park includes dirt trails on the surrounding hillsides and a ranger station, picnic areas, and several contoured riding areas in the valley floor adjacent to Corral Hollow Road. These features are all visible from Corral Hollow Road. The high degree of modification is substantially out of character with the surrounding open space and rural features of the area.

4.6.3 Sensitive Views in the Surrounding Area

Locations of visual sensitivity are defined in general terms as areas where high concentrations of people may be present or areas that are readily accessible to large numbers of people. They are further defined in terms of several site-specific factors including

- Areas of high scenic quality (i.e., designated scenic corridors or locations)
- Recreation areas characterized by high numbers of users with sensitivity to visual quality (i.e., parks, preserves, and private recreation areas)
- Important historic or archaeological locations

No visually sensitive locations are defined on the Livermore Site or Site 300. The visual sensitivities of areas surrounding the Livermore Site and Site 300 are described below.

Livermore Site

Sensitive views around the Livermore Site include residential areas and scenic routes or visual amenities designated by the city of Livermore or Alameda County, as described in Section 4.6.1, Scenic Resources Policies.

The Livermore Site is not visible from several designated scenic resource areas (e.g., Wente and Concannon wineries, Tesla historical town site, Altamont Pass Road, Cross Road, and Mines Road) and is only minimally visible from several other designated scenic resource areas as a result of distance or intermittent topography. The Livermore Site is relatively distant from I-580 (approximately 1.5 miles) and views are obstructed by vegetation and development. Only the tallest onsite building on the Livermore Site is intermittently visible from this highway. The Livermore Site is not visible from most of Flynn Road but does occupy the middle-ground views from the western end of Flynn Road. As a result of distance, the facilities are visually indistinct and are consistent with surrounding development. The view of the Livermore Site from Tesla Road is almost completely obstructed by intervening topography.

The Livermore Site is prominently visible from residences near and motorists traveling along Vasco Road. Vegetation that surrounds the Livermore Site obstructs or partially screens most views of the facilities from this area (Figure 4.6.3–1). The buffer zone provides visual separation between the Livermore Site and surrounding viewers.

The Livermore Site is also visible from residences and vineyards to the southwest, and to motorists traveling north on Vasco Road (Figure 4.6.3–2). The security buffer area and vegetation provide partial screening of the Livermore Site from this view. In addition, residential and vineyard development in this area is currently taking place and will further screen views of the facilities.

The Livermore Site is prominent in views from most of Greenville Road. Although Greenville Road follows the eastern boundary of the Livermore Site, views from this portion of the road are heavily screened by vegetation. Views from Greenville Road south of the Livermore Site are more panoramic due to the elevated viewing perspective, but are partially screened by the rolling topography (Figure 4.6.3–3). The Livermore Site is visually distinct in the foreground and middle-ground, but is visually consistent with the overall pattern of development in the view shed.

The Livermore Site is also prominent in views from the western portions of Patterson Pass Road from Vasco Road to Flynn Road. Views from Patterson Pass Road adjacent to the Livermore Site, similar to those described for Vasco Road, are largely screened by vegetation and are separated from viewers by a security buffer area (Figure 4.6.3–2). Views toward the west from the lower reaches of Patterson Pass Road are similarly obstructed by vegetation. Views of the facilities from the higher reaches of Patterson Pass Road are obstructed by topography.

Site 300

Sensitive views around Site 300 include the Carnegie State Vehicular Recreation Area and scenic routes designated by Alameda County or San Joaquin County, as described in Section 4.6.1.

Source: Original.

FIGURE 4.6.3–1.—*View of the Livermore Site Looking Southeast from Patterson Pass Road and Vasco Road*

Source: Original.

FIGURE 4.6.3–2.—*View of the Livermore Site Looking Northeast from Vasco Road*

Source: Original.

FIGURE 4.6.3–3.—*View of the Livermore Site Looking North from Greenville Road*

Site 300 is not within the view shed of any of the designated scenic corridors except for a very short section of Tesla Road at the eastern end of Alameda County. Tesla Road becomes Corral Hollow Road at the San Joaquin County boundary. Corral Hollow Road follows the southern boundary of Site 300 and affords views of the site, but is not designated as a scenic corridor. Corral Hollow Road, which is adjacent to and south of Site 300, is the nearest public roadway with a view of the site. The view of Site 300 from Corral Hollow Road is of parking areas and several single-story structures in the GSA (Figure 4.6.3-4). The remainder of the view of Site 300 from Corral Hollow Road consists of rolling hillsides and a few scattered small structures on the hilltops. Other than the GSA, the facilities of Site 300 are not apparent in landscape views from publicly accessible viewpoints; however, a 3-foot-high wire fence surrounding Site 300 is visible from Corral Hollow Road, along the site's southern boundary.

Site 300 can be seen from the Carnegie State Vehicular Recreation Area, which lies directly south. Building 899, a single-story structure, and its surrounding light posts are visible from the recreation area. From the picnic area near the park entrance, the view of Site 300 consists primarily of undeveloped hillsides.

Source: Original.

FIGURE 4.6.3–4.—*View of Site 300 Looking North from Corral Hollow Road*